TROCAR SYSTEM AND METHOD OF USE

BACKGROUND

1. Technical Field

The present disclosure relates to trocar systems for inserting cannulas into patients, and more particularly to modular trocar systems and methods of assembly of trocar systems.

2. Background of Related Art

Minimally invasive procedures are continually increasing in number and variation. Forming a relatively small diameter temporary pathway to the surgical site is the key feature of most minimally invasive surgical procedures. The most common method of providing such a pathway is by inserting a trocar assembly through the skin. In many procedures the trocar is inserted into an insufflated body cavity of a patient. In such procedures, trocar assemblies with seal mechanisms are utilized to provide the necessary pathway to the surgical site while minimizing leakage of insufflation gases through the inserted cannula.

Trocar assemblies typically include an obturator removably inserted through a cannula assembly. The obturator is assembled with the cannula portion such that the obturator's sharp tip portion extends from a distal end opening of the cannula to facilitate insertion of the cannula through the body wall of the patient. Trocar assemblies are commonly provided with a safety shield of some fashion which protects against unintentional puncturing by the sharpened tip of the obturator. Mechanisms which control the relative movement and locking of the safety shield and the obturator's penetrating tip exist. Such mechanisms can be complex and often require numerous moving parts to accomplish the release and resetting of a the safety shield lock feature so as to permit the obturator's penetrating tip to function only when desired to facilitate insertion of the trocar assembly and placement of the cannula portion thereof.

A continuing need exists for novel trocar assemblies which provide safety shield latch mechanisms which require fewer component parts while providing increased reliability before, during and after insertion of the trocar assembly in a patient.

SUMMARY

The present disclosure provides a modular trocar system which overcomes disadvantages associated with previous trocar systems. The presently disclosed modular trocar system satisfies the need for more reliable trocar assemblies while improving manufacturing efficiencies.

In particular, the present disclosure provides trocar system including a cannula and an obturator assembly being at least partially insertable through the cannula. The obturator assembly including a housing, a penetrating tip disposed at a distal end, an elongated shield including a guard extending from a shaft are movable relative to the penetrating tip, and a latch mechanism disposed generally within the housing. The latch mechanism facilitates changing the configuration of the obturator assembly between a fixed-shield orientation, wherein at least a portion of the guard is maintained to extend at least partially distal of the penetrating tip to prevent puncturing of tissue by the penetrating tip, to a non-fixed shield orientation whereby upon application of force to the distal end of the obturator assembly, the guard and penetrating tip are permitted to move relative one another to facilitate puncturing of tissue by the penetrating tip.

BRIEF DESCRIPTION OF THE DRAWINGS

Various embodiments are described herein with reference to the drawings, wherein:

FIG. 1 is a perspective view of one embodiment of the modular trocar system constructed in accordance with the present disclosure;

FIG. 2 is a perspective view of an obturator assembly constructed in accordance with the present disclosure;

FIG. 3 is a perspective view with parts separated of the obturator assembly of the embodiment of FIG. 2;

FIG. 4 is an enlarged perspective view of a latch mechanism for a safety shield of the obturator assembly of the embodiment of FIG. 2;

FIG. 5 is a perspective view of a shield member of the obturator assembly;

FIG. 6 is a perspective view of a slider member of the latch mechanism;

FIG. 7 is a perspective view of a knife assembly of the obturator assembly;

FIG. 8 is an enlarged view of the indicated area of detail in FIG. 7;

FIG. 9 is a perspective view of the distal end of the knife assembly of FIG. 7;

FIG. 10 is a horizontal cross-sectional view taken through the knife assembly of FIG. 7;

FIG. 11 is a cross-sectional view taken along section line 11-11 of FIG. 10;

FIG. 12 is a perspective view illustrating a step of assembling the obturator assembly;

FIG. 13 is a further step of assembling the obturator assembly;

FIG. 14 is a perspective view of the inside of a housing cover of the obturator assembly;

FIG. 15 is a further step in the method of assembling the obturator assembly;

FIG. 16 is a longitudinal cross-sectional view illustrating the assembled shield member and a shield extension member;

FIG. 17 is a further step illustrating the assembly of a knife rod with previously assembled components of the obturator assembly;

FIG. 18 is a cross-sectional view of the proximal end of the components of the obturator assembly illustrated in FIG. 17;

FIG. 19 is a view similar to FIG. 18, which illustrates securement of the knife rod within the housing cover;